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EXAMINER	
ABDI, AMARA	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/723,363	TUTTLE ET AL.	
	Examiner	Art Unit	
	Amara Abdi	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _09 October 2008_.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1,2,4-7,14-16,18-20,22-24,26,27,29-31,39 and 43_ is/are pending in the application.

4a) Of the above claim(s) _3, 8-13, 17, 21, 25, 28, 32-38, 40-42, 44-57_ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1,2,4-7,14-16,18-20,22-24,26,27,29-31,39 and 43_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _11/26/2003_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-2, 4, 5, and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Miyake et al. (US-PGPUB 2002/0140836).

(1) Regarding claim 1:

Miyake et al. teach a microelectronic imager, comprising:

an imaging unit (Fig 6) including a microelectronic die (11 in Fig. 1) with an image sensor (12 in Fig. 1) and a first referencing element (14 and 16 makes up the first referencing element) fixed to the imaging unit (as shown in Fig. 6, element 14 and 16 are fixed to the imaging unit) (paragraph [0049]); and

an optics unit (the aperture having lens make up the optic unit) having an optic member (19 in Fig. 6) and a second referencing element (18 in Fig. 6) fixed to the optics unit (as shown in Fig. 6, the element 18 is fixed to the optical unit), the second referencing element (18) being seated and in direct contact with the first referencing element (14,16) at a fixed, preset position in which the optic member (18 in Fig. 6) is

situated at a desired location relative to the image sensor (12 in Fig. 6) (Fig. 6, paragraph [0051]).

(2) Regarding claim 2:

Miyake et al. teach the imager of claim 1, wherein:

the first referencing element (14, 16) has a first interface feature (20b in Fig. 6) at a first reference location relative to the image sensor on the die (as shown in Fig. 6, element 20b is at location relative to the element 12) (Fig. 6, paragraph [0051]);

the second referencing element (18) has a second interface feature (21b in Fig. 6) at a second reference location relative to the optic member (as shown in Fig. 6, the element 21b is at location relative to the optic unit 19) (Fig. 6, paragraph [0051]); and

the first interface feature (20b) is engaged with the second interface feature (21b) with the first reference location coinciding with the second reference location (as shown in Fig. 6, element 21b is engaged with element 20b) whereby the optic member (18 in Fig. 6) is aligned with the image sensor (12 in Fig. 6) and positioned at a desired distance from the image sensor (as shown in Fig. 6, the element 18 is aligned with the element 12) (Fig. 6, paragraph [0051]).

(3) Regarding claim 4:

Miyake et al. teach the imager of claim 1, wherein:

the imaging unit further comprises a cover (16) over the die (11) (Fig. 1, paragraph [0042]);

the first referencing element (14, 16) comprises a first support (20 in Fig. 1) projecting from the cover (16), the first support (20) having a first alignment component

(20c) at a preset lateral location from the image sensor (12) and a first stop component (20a) at a fixed, preset elevation from the image sensor (12) (as shown in Fig. 1, the element (20a) at preset location from light acceptance plane (12), and element 20a at fixed, preset location from the light acceptance plane (12)) (Fig. 1, paragraph [0042])

the second referencing element (18) comprises a second support (21 in Fig. 1) projecting from the optics unit (the aperture having lens make up the optic unit), the second support having (a) a second alignment component (21c) juxtaposed to the first alignment component (20c) to align the optic member (18) with a centerline of the image sensor (12), and (b) a second stop component (21a) juxtaposed to the first stop component (20a) to space the optic member apart from the image sensor (12) by a desired distance (focal length) (Figs 1 and 6, paragraph [0042], [0051]).

(4) Regarding claim 5:

Miyake et al. teach the imager of claim 1 wherein the first referencing element (14, 16) comprises a first support (20) on the die (11) around the image sensor (12) and the second referencing element (18) comprises a second support (21) on the optics unit around the optic member, and the first support on the die is mated with the second support on the optics unit (Fig. 1, 6, paragraph [0042], [0051]), (as shown in Figures 1 and 6, the first support on the die (20, 11) is mated with the second support on the optics unit (21,19)).

(5) Regarding claim 7:

Miyake et al. teach the imager of claim 1 wherein the first referencing element (14, 16) comprises a first support (20) having a first step (20a, 20c) (the two faces 20a

and 20c of the first support (20) are making the first step) and the second referencing element (18) comprises a second support (21) having a second step (21a, 21c) (the two faces (21a, 21c) of the second support (21) are making the second step) matted with the first step of the first support (as shown in Fig. 1, 6, the second step (21a, 21c) is matted with the first step (20a, 20c)) (paragraph [0042],[0051]).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 6, 14-16, 18-20, 22-24, 26-27, 29-31, 39, and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyake et al. (US-PGPUB 2002/0140836) in view of Kim et al. (US-PGPUB 2003/0223008).

(1) Regarding claim 6:

Miyake et al. teach the parental claim 1. Furthermore, Miyake et al. teach that the image unit further comprises a cover (16) over the die (11) (Fig. 1, paragraph [0042]); the first referencing element (14, 16) comprises a first support (20 in Fig. 1) on the cover (16) and the second referencing element (18) comprises a second support (21 in Fig. 1) on the optic unit (the aperture having lens make up the optic unit) around the optic member (19), and the first support on the cover is mated with the second support on the

optic unit (Fig. 1, 6, paragraph [0042], [0051]), (as shown in Figures 1 and 6, the first support on the die (20, 11) is mated with the second support on the optics unit (21,19)).

However, Miyake et al. do not teach explicitly that the cover is over the image sensor.

Kim et al. in analogous environment teach the cover (5) over the image sensor (2) (Fig. 2, paragraph [0024]), (as shown in Fig. 2, the filter (5) (cover) is over the image sensor (2)).

It is desirable to provide a novel camera module, the height of which is desirably lowered while a desired distance between an upper side of a lens and an image sensor is constantly maintained without changing the optical performance of the lens. The Kim's approach, where the filter is over the image sensor is to achieve this goal. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention, to apply Kim's teaching to substitute Miyake's element (16) with the Kim's element (5), because such combination provides a novel camera module, the height of which is desirably lowered while a desired distance between an upper side of a lens and an image sensor is constantly maintained without changing the optical performance of the lens (paragraph [0012], lines 2-6).

(2) Regarding claim 14:

Miyake et al. teach a microelectronic imager, comprising:

a microelectronic die (11 in Fig. 1) having an image sensor (12 in Fig. 1)

a first referencing element (14, 16) fixed relative to the die (11) (as shown in Fig. 6, elements 14, 16 are fixed to element (11)), the first referencing element (14, 16)

having a first alignment component (20c) at a lateral distance from the image sensor (12) and a first stop component (20a) apart from the image sensor along an axis normal to the image sensor by separation distance (as shown in Fig. 1, the element (20a) is apart from the light acceptance plane (12) along the axis normal to the image sensor (12)).

an optics unit (the aperture having lens make up the optic unit) having an optic member (19);

and a second referencing element (18) connected to the optics unit (the aperture having lens make up the optic unit), the second referencing element (18) having a second alignment (21c) component engaged with the first alignment component (20c) to align the optic member (18) with the image sensor (12) and a second stop component (21a) engaged with the first stop component (20a) to space the optic member apart from the image sensor by a desired distance (focal length) (Fig. 1, 6, paragraph [0042], lines [0051].

However, Miyake et al. do not teach explicitly the plurality of external contacts electrically coupled to the image sensor.

Kim et al. in analogous environment teach the plurality of external contacts (1) electrically coupled to the image sensor (2) (Fig. 2, paragraph [0024]), (as shown in Fig. 2, the image sensor (2) is connected to the substrate (1) by wire bounding).

It is desirable to provide a novel camera module, the height of which is desirably lowered while a desired distance between an upper side of a lens and an image sensor is constantly maintained without changing the optical performance of the lens. The

Kim's approach, where the image sensor (2) is connected to the substrate (1) by wire bounding is to achieve this goal. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention, to apply Kim's teaching, where the image sensor (2) is connected to the substrate (1) by wire bounding, with the Kim's teaching, because such combination provides a novel camera module, the height of which is desirably lowered while a desired distance between an upper side of a lens and an image sensor is constantly maintained without changing the optical performance of the lens (paragraph [0012], lines 2-6).

(3) Regarding claim 15:

Miyake et al. further teaches the imager of claim 14 wherein:

the first referencing element (14, 16) comprises a first support (20 in Fig. 1) projecting from one of the die (11) or a cover (16) over the die, and the first support includes the first alignment component (20c) and the first stop component (20a); and the second referencing element (18) comprises a second support (21 in Fig. 1) projecting from the optics unit (the aperture having lens make up the optic unit), and the second support includes the second alignment component (21c) and the second stop component (21a) (Fig. 1, 6, paragraph [0042],[0051]).

(4) Regarding claim 16:

Miyake et al. teach the imager of claim 1 wherein the first referencing element (14, 16) comprises a first support (20) having a first step (20a, 20c) (the two faces 20a and 20c of the first support (20) are making the first step) and the second referencing element (18) comprises a second support (21) having a second step (21a, 21c) (the two

faces (21a, 21c) of the second support (21) are making the second step) matted with the first step of the first support (as shown in Fig. 1, 6, the second step (21a, 21c) is matted with the first step (20a, 20c)) (paragraph [0042],[0051]).

(5) Regarding claim 18:

Miyake et al. teach a microelectronic imager, comprising:

An imaging unit (Fig. 6) including (a) a microelectronic die (11 in Fig. 1) having an image sensor (12 in Fig. 1), and (b) a first referencing element (14, 16) fixed to the imaging unit (as shown in Fig. 6, elements 14, 16 are fixed to element (11)); and

an optics unit (the aperture having lens make up the optic unit) having an optic member (18) and a second referencing element (18) fixed to the optics unit (the aperture having lens make up the optic unit), the first and second referencing element ((14,16) and (18)) being configured to align the optic member (19) with the image sensor (12) and space the optic member apart from the image sensor by a desired distance (focal length) (Fig. 1, 6, paragraph [0042], lines [0051]) when the first and second referencing elements are seated together (when elements (14, 16) and 18 are seated together) (Fig. 6).

However, Miyake et al. do not teach explicitly the plurality of external contacts electrically connected to the image sensor.

Kim et al. in analogous environment teach the plurality of external contacts (1) electrically connected to the image sensor (2) (Fig. 2, paragraph [0024]), (as shown in Fig. 2, the image sensor (2) is connected to the substrate (1) by wire bounding).

It is desirable to provide a novel camera module, the height of which is desirably lowered while a desired distance between an upper side of a lens and an image sensor is constantly maintained without changing the optical performance of the lens. The Kim's approach, where the image sensor (2) is connected to the substrate (1) by wire bounding is to achieve this goal. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention, to apply Kim's teaching, where the image sensor (2) is connected to the substrate (1) by wire bounding, with the Kim's teaching, because such combination provides a novel camera module, the height of which is desirably lowered while a desired distance between an upper side of a lens and an image sensor is constantly maintained without changing the optical performance of the lens (paragraph [0012], lines 2-6).

(6) Regarding claim 19:

Miyake et al. further teach the imager of claim 1, wherein:

the first referencing element (14, 16) has a first interface feature (20b in Fig. 6) at a first reference location relative to the image sensor on the die (as shown in Fig. 6, element 20b is at location relative to the element 12) (Fig. 6, paragraph [0051]);

the second referencing element (18) has a second interface feature (21b in Fig. 6) at a second reference location relative to the optic member (as shown in Fig. 6, the element 21b is at location relative to the optic unit 19) (Fig. 6, paragraph [0051]); and

the first interface feature (20b) is engaged with the second interface feature (21b) with the first reference location coinciding with the second reference location (as shown in Fig. 6, element 21b is engaged with element 20b) whereby the optic member (18 in

Fig. 6) is aligned with the image sensor (12 in Fig. 6) and positioned at a desired distance from the image sensor (as shown in Fig. 6, the element 18 is aligned with the element 12) (Fig. 6, paragraph [0051]).

(7) Regarding claim 20:

Miyake et al. further teach the imager of claim 1, wherein:

the first referencing element (14, 16) comprises a first support (20 in Fig. 1) projecting from the die (11), the first support (20) having a first alignment component (20c) at a preset lateral location from the image sensor (12) and a first stop component (20a) at a fixed, preset elevation from the image sensor (12) (as shown in Fig. 1, the element (20a) at preset location from light acceptance plane (12), and element 20a at fixed, preset location from the light acceptance plane (12)) (Fig. 1, paragraph [0042]); and

the second referencing element (18) comprises a second support (21 in Fig. 1)

fixed to the optics unit (the aperture having lens make up the optic unit), the second support having (a) a second alignment component (21c) juxtaposed to the first alignment component (20c) to align the optic member (18) with a centerline of the image sensor (12), and (b) a second stop component (21a) juxtaposed to the first stop component (20a) to space the optic member apart from the image sensor (12) by a desired distance (focal length) (Figs 1 and 6, paragraph [0042], [0051]).

(8) Regarding claim 22:

Miyake et al. further teach the imager of claim 1 wherein the first referencing element (14, 16) comprises a first support (20) on the die (11) around the image sensor

(12) and the second referencing element (18) comprises a second support (21) on the optics unit around the optic member, and the first support on the die is mated with the second support on the optics unit (Fig. 1, 6, paragraph [0042], [0051]), (as shown in Figures 1 and 6, the first support on the die (20, 11) is mated with the second support on the optics unit (21,19)).

(9) Regarding claim 23:

Miyake et al. further teach the parental claim 1. Furthermore, Miyake et al. teach that the image unit further comprises a cover (16) over the die (11) (Fig. 1, paragraph [0042]); the first referencing element (14, 16) comprises a first support (20 in Fig. 1) on the cover (16) and the second referencing element (18) comprises a second support (21 in Fig. 1) on the optic unit (the aperture having lens make up the optic unit) around the optic member (19), and the first support on the cover is mated with the second support on the optic unit (Fig. 1, 6, paragraph [0042], [0051]), (as shown in Figures 1 and 6, the first support on the die (20, 11) is mated with the second support on the optics unit (21,19)).

(10) Regarding claim 24:

Miyake et al. further teach the imager of claim 1 wherein the first referencing element (14, 16) comprises a first support (20) having a first step (20a, 20c) (the two faces 20a and 20c of the first support (20) are making the first step) and the second referencing element (18) comprises a second support (21) having a second step (21a, 21c) (the two faces (21a, 21c) of the second support (21) are making the second step)

matted with the first step of the first support (as shown in Fig. 1, 6, the second step (21a, 21c) is matted with the first step (20a, 20c)) (paragraph [0042],[0051]).

(11) Regarding claim 26:

Miyake et al. teach a microelectronic imager, comprising:

An imaging unit (Fig. 6) including (a) a microelectronic die (11 in Fig. 1) having an image sensor (12 in Fig. 1), and (b) a first stand-off section (20) fixed to the imaging unit, (as shown in Fig. 1, the element (20) is fixed to the imaging unit) and having a first interface area (20a, 20c) at a set reference position relative to the image sensor (12), (as shown in Fig.1, 6, the element 20a, 20c are at a set reference position relative to the light acceptance plane);

an optics unit (the aperture having lens make up the optic unit) having an optic member (19) and a second stand-off section (21) fixed to the optics unit (the aperture having lens make up the optic unit), (as shown in Fig. 1, the element 21 is fixed to the optic unit), the second stand-off section (21) having a second interface area (21a, 21c) at set reference position relative to the optic member (19), (as shown in Figs. 1, 6, the elements 21 a, 21c are at set reference position relative to the lens), and the first interface area (20a, 20c) being seated with the second interface area (21a, 21c), (as shown in Figs, 1, 6, the element 20a, 20c are seated together with elements 21a, 21c) to connect the first stand-off section (20) with the second stand-off section (21) in a configuration in which the optic member (19) is at a desired location (focal length) relative to the image sensor (12) (Figs 1, 6, paragraph [0042], lines [0051])

However, Miyake et al. do not teach explicitly the plurality of external contacts electrically coupled to the image sensor.

Kim et al., in analogous environment, teach the plurality of external contacts (1) electrically coupled to the image sensor (2) (Fig. 2, paragraph [0024]), (as shown in Fig. 2, the image sensor (2) is connected to the substrate (1) by wire bounding).

It is desirable to provide a novel camera module, the height of which is desirably lowered while a desired distance between an upper side of a lens and an image sensor is constantly maintained without changing the optical performance of the lens. The Kim's approach, where the image sensor (2) is connected to the substrate (1) by wire bounding is to achieve this goal. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention, to apply Kim's teaching, where the image sensor (2) is connected to the substrate (1) by wire bounding, with the Kim's teaching, because such combination provides a novel camera module, the height of which is desirably lowered while a desired distance between an upper side of a lens and an image sensor is constantly maintained without changing the optical performance of the lens (paragraph [0012], lines 2-6).

<u>(12) Regarding claim 27:</u>

Miyake et al. further teach the imager of claim 26, wherein:

The first stand-off section (20) projects from the die (11), and the first interface area (20a, 20c) has a first alignment component (20c), at a preset lateral location from the image sensor (12) and a first stop component (20a) at a fixed, preset elevation from the image sensor (12) (as shown in Fig. 1, the element (20a) at preset location from

light acceptance plane (12), and element 20c at fixed, preset location from the light acceptance plane (12)) (Fig. 1, paragraph [0042]); and

The second stand-off section (21) projects from the optics unit, and the second interface area (21a, 21c) has (a) a second alignment component (21c) juxtaposed to the first alignment component (20c) to align the optic member (18) with a centerline of the image sensor (12), and (b) a second stop component (21a) juxtaposed to the first stop component (20a) to space the optic member apart from the image sensor (12) by a desired distance (focal length) (Figs 1 and 6, paragraph [0042], [0051]).

(13) Regarding claim 29:

Miyake et al. further teach the imager of claim 26 wherein the first stand-off section (20) projects from the die (11) and extends around the image sensor (12) and the second stand-off section (21) projects from the optics unit extends around the optic member (19), and the first interface area (20a, 20c) is mated with the second interface area (21a, 21c) (Fig, 1,6, paragraph [0042],[0051]).

(14) Regarding claim 30:

Miyake et al. further teach the imager of claim 26 wherein:

the image sensor further comprises a cover (16) over die (11); and

the first stand-off section (20) projects from the cover (16) and the second stand-off section (21) projects from the optics unit, and the first interface area (20a, 20c) is mated with the second interface area (21a, 21c) (Fig. 1, 6, paragraph [0042],[0051]).

However, Miyake et al. do not teach explicitly that the cover is over the image sensor.

Kim et al., in analogous environment, teach the cover (5) over the image sensor (2) (Fig. 2, paragraph [0024]), (as shown in Fig. 2, the filter (5) (cover) is over the image sensor (2)).

It is desirable to provide a novel camera module, the height of which is desirably lowered while a desired distance between an upper side of a lens and an image sensor is constantly maintained without changing the optical performance of the lens. The Kim's approach, where the filter is over the image sensor is to achieve this goal. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention, to apply Kim's teaching to substitute Miyake's element (16) with the Kim's element (5), because such combination provides a novel camera module, the height of which is desirably lowered while a desired distance between an upper side of a lens and an image sensor is constantly maintained without changing the optical performance of the lens (paragraph [0012], lines 2-6).

(15) Regarding claim 31:

Miyake et al. further teach the imager of claim 26, wherein the first interface area (20a, 20c) comprises a first step (20a, 20c) and the second interface area (21a, 21c) comprises a second step (21a, 21c) mated with the first step (as shown in Fig. 1, 6, the second step (21a, 21c) is matted with the first step (20a, 20c)) (paragraph [0042],[0051]).

(16) Regarding claim 39:

Miyake et al. teach a method of packaging an imager, comprising:

providing an imaging unit (Fig. 6) having (a) a microelectronic die (11) with an image sensor (12), and (b) a first referencing element (16) fixed to the imaging unit (Fig. 6), (as shown in Fig. 6, element (16) is fixed to the imaging unit) and having a first interface feature (20a, 20c) at a set reference position relative to the image sensor (12) (Fig. 1, 6, paragraph [0042],[0051]);

providing an optics unit (aperture having lens make up the optic unit) having an optic member (19) and a second referencing element (18) fixed to the optics unit, (as shown in Fig. 6, element 18 is fixed to the optic unit), the second referencing element (18) having a second interface feature (21a, 21c) at a set reference position relative to the optic member (19) (Fig. 1, 6, paragraph [0042],[0051]); and

attaching the second referencing element (18) to the first referencing element (16) by seating the second interface feature (21a, 21c) with the first interface feature (20a, 20c) in a predetermined position in which the optic member (19) is at a desired location relative to the image sensor (12) (Fig. 1, 6, paragraph [0042],[0051]).

However, Miyake et al. do not teach explicitly the plurality of external contacts electrically coupled to the image sensor.

Kim et al., in analogous environment, teach the plurality of external contacts (1) electrically coupled to the image sensor (2) (Fig. 2, paragraph [0024]), (as shown in Fig. 2, the image sensor (2) is connected to the substrate (1) by wire bounding).

It is desirable to provide a novel camera module, the height of which is desirably lowered while a desired distance between an upper side of a lens and an image sensor is constantly maintained without changing the optical performance of the lens. The

Kim's approach, where the image sensor (2) is connected to the substrate (1) by wire bounding is to achieve this goal. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention, to apply Kim's teaching, where the image sensor (2) is connected to the substrate (1) by wire bounding, with the Kim's teaching, because such combination provides a novel camera module, the height of which is desirably lowered while a desired distance between an upper side of a lens and an image sensor is constantly maintained without changing the optical performance of the lens (paragraph [0012], lines 2-6).

(17) Regarding claim 43:

Miyake et al. teach the imager of claim 1 wherein the first referencing element (14, 16) comprises a first support (20) having a first step (20a, 20c) (the two faces 20a and 20c of the first support (20) are making the first step) and the second referencing element (18) comprises a second support (21) having a second step (21a, 21c) (the two faces (21a, 21c) of the second support (21) are making the second step) matted with the first step of the first support (as shown in Fig. 1, 6, the second step (21a, 21c) is matted with the first step (20a, 20c)) (paragraph [0042],[0051]).

Contact Information:

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amara Abdi whose telephone number is (571)270-1670. The examiner can normally be reached on Monday through Friday 8:00 Am to 4:00 PM E.T..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on (571) 272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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